

CBE K-12 Mathematics Strategy Overview

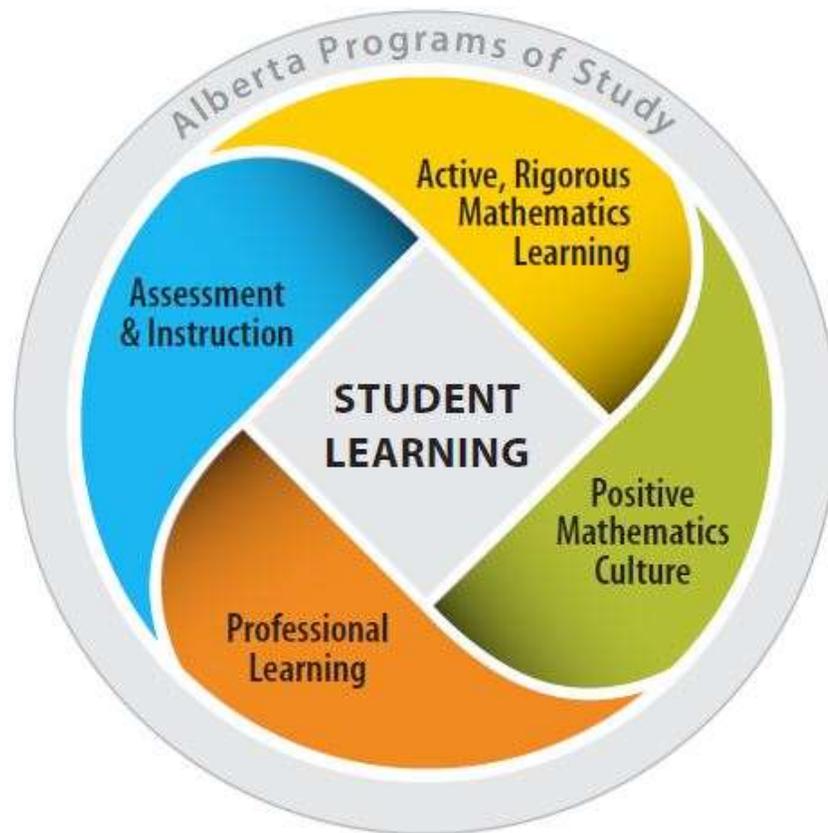
Thank you for participating in our K-12 Mathematics Strategy Engagement and for your interest in math learning.

Throughout the 2016-17 school year the Calgary Board of Education worked to develop its K-12 Mathematics Strategy. The strategy reflects data on CBE students' achievement and our provincial context, educational research as well as input from students, teachers, parents, community members, mathematicians and post-secondary educators.

The following is an overview of the strategy that is intended to help students be more successful in their math learning. The math strategy will guide principals and teachers in determining the appropriate actions to take to improve student outcomes in math. The CBE also recognizes parents as partners in their child's learning. School and classroom-specific actions will vary in response to the needs of specific groups of students and will be informed by research, best practice and ongoing data analysis.

CBE's Mathematics Strategy focuses on the following:

- Ensuring mathematics learning programs are active and rigorous
- Enhancing positive mathematics cultures in each school
- Building clarity and coherence in mathematics instruction and assessment practices
- Providing professional learning to enhance teacher confidence and skill



Active, Rigorous Mathematics Learning

- Build strong mathematical foundations so students can understand complex mathematical ideas
- Ensure students participate in learning activities that develop their mathematical reasoning and communication skills
- Create more opportunities for students to be active problem solvers

Assessment and Instruction

- Build opportunities for students to practice math skills over time
- Focus on the connections between conceptual understanding, problem solving and mental math
- Use mathematical discussion with/among students to build and solidify concepts
- Communicate clearly with families about student learning in math
- Strengthen the use of specific feedback and guidance to students during learning

Positive Mathematics School Culture

- Know that every student can be successful and confident at learning mathematics
- Teachers and parents help build mathematical thinking by connecting math to other subjects and everyday life.

Professional Learning

- Build teacher confidence and skill with mathematics content and teaching through:
 - Whole-school learning
 - Teacher collaboration within schools
 - Individual teacher learning

K-12 Mathematics Strategy Background

Engagement Summary

To help develop the strategy, input was gathered through online surveys and face-to-face sessions from October 2016 to March 2017. More than 5,500 parents, students, teachers, community members and post-secondary educators/ mathematicians participated.

Participant Groups	Number of Participants
Teachers and non-classroom based educators	314
School administrators	182
Students	140
Parents/Guardians – face to face	218
Parents/Guardians – online	4852
Post-Secondary Educators/Mathematicians	14

Summary of what we were asked to consider when developing the Mathematics Strategy.

Students	Educators	Parents/Guardians	Post-Secondary
<ul style="list-style-type: none"> ▪ Instruction for individual learning needs ▪ Opportunities to be active problem solvers ▪ Practice for mastery ▪ Teacher support 	<ul style="list-style-type: none"> ▪ Build students' understanding of mathematical concepts and use of mathematical language ▪ Connections within and across programs of study ▪ Assessment practices ▪ Professional learning and resources 	<ul style="list-style-type: none"> ▪ Quality instruction ▪ Basic skills and strong foundations ▪ Learning by applying math to real-life situations ▪ Parent resources and communication 	<ul style="list-style-type: none"> ▪ Student understanding of the nature of mathematics ▪ Teacher comfort and competency ▪ Fluency and practice

Some common themes emerged amongst participants including:

- Share best practices in mathematics instruction and assessment
- Build teacher confidence and skill with mathematics content and teaching
- Know students and how they learn best
- Communicate with families about student learning
- Provide resources for teachers to support teaching and assessment

Visit cbe.ab.ca/dialogue to learn more about the engagement process and findings from the in-person sessions and online survey.

Student Learning Results

The CBE continually reviews student results to identify areas for improvement. Overall CBE students do well in Mathematics based on report card data and provincial achievement results. CBE student results are generally higher than provincial results in math, but like the province, CBE Provincial Achievement Tests (PAT) results for Gr. 6 and 9 are declining. We want to improve.

Report Card Data

Report card data showed that in 2015-16 91.5 per cent of students from kindergarten to Grade 12 met learning expectations in Mathematics. Success levels for students in K-6 and Grades 10-12 were higher than in Grades 7-9.

The K-9 report card stem “uses mathematical reasoning to analyze and solve problems” indicates a lower level of student success than other areas of mathematics learning, particularly for Grades 7 to 9.

Provincial Testing Data

In 2015-16 the percentage of CBE students meeting the Acceptable Standard for each of the Mathematics provincial tests was:

- Mathematics 6: 75.0%
- Mathematics 9: 67.9%
- Mathematics 9 K&E: 53.6%
- Mathematics 30-1: 76.0%
- Mathematics 30-2: 78.2%

CBE results on Diploma Exams are above provincial results.

For more information on our students results, visit our [website](#).

Provincial Context

The Alberta Mathematics Programs of Study (curriculum) define student learning outcomes for each grade and course K-12.

Alberta's math program encourages students to develop mathematical reasoning and problem-solving skills and make connections between mathematics and its applications. The Provincial program also builds students' confidence in their mathematical skills and appreciation of the subject.

Recently Alberta Education has taken steps to provide future direction for mathematics teaching and learning.

- In December 2016 a provincial Mathematics Review and Report to the Premier and Minister of Education recommended:
 - An increased availability and access to high-quality professional development and training opportunities specific to the teaching of Mathematics.
 - A shift in the culture of mathematics in school, including placing a focus on numeracy in schools at all grade levels.
 - Alberta Education re-instate a written portion to the Mathematics 30-1 and Mathematics 30-2 diploma exams.
 - That the use of calculators is thoughtful, age appropriate, and balanced with demonstrations of understanding without the aid of technology.
 - That Alberta Education consider integrating the subject's introduction section of future curriculum with the learning outcomes. (what students are expected to know, understand and be able to do)
 - That Advanced Education undertakes a focused research initiative to inform a long-term study on how to monitor readiness and success in post-secondary mathematics programs.
- In spring of 2016, clarifications on student learning outcomes in the K-9 Programs of Study were made.
- In May 2017, a \$1-million bursary program to help teachers strengthen their knowledge, skill and confidence in teaching mathematics was announced.
- In June 2017, a separate computational component was reintroduced to the Grade 6 Provincial Achievement Test.

Educational Research

A wide variety of educational research was considered from national and international sources in developing our K-12 mathematics strategy. Areas of research included assessment, professional learning, instructional practices and mathematical learning theory and approaches.

Next Steps

The CBE will continue to work with Alberta Education. The CBE's Math Strategy aligns with the provincial direction.

In the fall, we will be sharing more details about the K-12 Mathematics Strategy with schools. Through the school development planning processes, schools will be working with their communities to identify how the strategy can contribute to their specific goals.

We will provide a further update to parents on how the Mathematics Strategy is being implemented. Parents are encouraged to speak with their school principal about how the strategy is incorporated in their school development plan.

